This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 824386.



# AGGREGATORS EDITION

# MERLON
## WHAT'S IN IT FOR ME?

## BACKGROUND

MERLON introduces an integrated modular local energy management system for the holistic operational optimization of local energy systems in presence of high shares of volatile distributed renewable energy sources. MERLON will enable the realization of novel business models, allowing local/citizens energy communities to introduce themselves local flexibility markets. It equips local stakeholders like Aggregators and Energy Cooperatives with innovative and highly effective tools for the establishment of robust business practices to exploit their microgrids and dynamic virtual power plants as balancing and ancillary assets toward grid stability and alleviation of network constraints.

## OBJECTIVES

MERLON will attempt to pave the way and lead the transition towards more democratized energy markets that allow open participation of currently excluded flexibility sources and promote transparent and fair distribution of the benefits achieved through flexibility sharing and utilization.

A main target of the project is the establishment of local/citizens energy communities and local flexibility markets for the empowerment of local energy/flexibility stakeholders and the establishment of viable business cases.

## SOLUTION

**In this context, MERLON will enable Aggregators and Energy Cooperatives to...**

- ...accurately forecast demand response and demand flexibility potential via self-learning algorithms, that create dynamic constructs of prosumer energy behaviours and correlate them with ambient information to deliver robust context-aware demand flexibility profiles.
- ...optimally segment, classify and cluster/aggregate demand, storage, EV and CHP assets for the formulation of virtual power plants for the provision of flexibility services to the local DSO.
- ...continuously monitor the evolution of flexibility and demand response events and signals and revise pre-defined strategies with the re-configuration of dynamic virtual power plants to ensure service realization and avoidance of penalisation in dynamic contexts.
- ...gain access to a wide variety of distributed energy resources assets (generation, demand, storage, EV, CHP) through a properly configured open and fully transparent flexibility pooling and sharing marketplace and negotiate with individual flexibility owners on the terms (frequency, duration, capacity) of flexibility activation on the basis of standardised and blockchain-enabled smart contracts.

**The MERLON solution and integrated optimization framework will be validated in 2 local energy systems/pilot sites, located in Austria and France.**

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## WHY SHOULD WE CARE?

Flexibility Aggregators will play a pivotal role in the future energy markets. To achieve their business objectives and create a viable business case, they need to access multiple sources of flexibility and properly analyse and cluster them to provide added value services to the energy system. Apart from the straightforward flexibility that can be offered by energy storage technologies, Aggregators should be able to make the most out of the untapped flexibility potential of small commercial/industrial and residential prosumers.

As a consequence, new revenue streams can be created for local Aggregators and Energy Cooperatives by introducing their energy infrastructure as active balancing and ancillary assets in energy markets through explicit demand response schemes that allow them to offer and bid their flexibility in energy markets.

## GOOD TO KNOW

**Within the project, specific tools will be developed for Aggregators and Energy Cooperatives:**

The Global Flexibility Manager-platform is responsible for the definition of the high-level flexibility control strategies to be deployed over appropriately selected clusters of distributed flexibility sources. It will utilize and process information received by the following sub-components to define appropriate flexibility clusters, that can effectively participate in local energy system optimisation strategies:

**Flexibility Forecasting, Segmentation and Aggregation Module**

This component is responsible for the multidimensional analysis, correlation and efficient management of flexibility profiles to provide specific optimisation functions and different grid services, e.g. balancing, frequency response or voltage regulation

**Virtual Power Plant Configurator and Flexibility Control Dispatch Module**

This component will continuously monitor the evolution of the flexibility control strategies, revise strategies if necessary and optimise business functions and energy transactions of all stakeholders involved

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